Space Weather Forecast

Issued on Tuesday, 09 January 2024 at 12:56 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Low activity with various Common-class flares from across the disc. There are twelve sunspot regions, dominated by two clusters. In the western disc, a previously active region remains an elongated spot but continues its slow decay, with a simplifying magnetic structure. In the far northwest a region has been growing of late, perhaps developing some weak magnetic complexity. A nearby has also grown, whilst the other regions in this area appear stable or in decay. The other cluster consists of two sunspots close together in the southeast, both of which are showing little change, and overall also remain relatively simple. A single large region has rotated onto the southeastern hemisphere, currently appearing as a simple unipolar spot. This may be part of a more complex region yet to rotate on, but currently this cannot be deduced with available imagery. No Earth-directed Coronal Mass Ejections (CMEs) were observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds showed a weak enhancement likely due to a transient CME or perhaps a weak fast wind. Wind speeds were at background levels, but jumped from around 320 km/s to near 400 km/s. Interplanetary magnetic field (IMF) has been mostly weak but with a couple of brief moderate peaks. The north-south component has varied weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) were just very slightly elevated, but well below the level of a minor radiation storm (S1).

Four-Day Space Weather Forecast Summary
Solar Activity: There is an ongoing chance of isolated Moderate flares with a slight chance of Strong flares.

Solar Wind / Geomagnetic Activity: There are two potential glancing coronal mass ejection impacts, one from 05 Jan, arriving day 1 (09 Jan) and another from 06 Jan, arriving later day 1 or day 2 (09-10 Jan), however these are both low confidence. Otherwise some interaction with the fast wind of a weak coronal hole remains possible day 1 (09 Jan), but this is likely to have only a very limited impact on observed solar winds. Quiet geomagnetic conditions are expected to persist for much of the period, but may rise to Unsettled with a chance of Active days 1 and 2 (09-10 Jan), in association with any coronal mass ejection or coronal hole fast wind arrival.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to continue gradually easing, likely persisting well below the level of a minor radiation storm (S1). However there is a slight chance of further increases, should there be any notable flare activity.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	45
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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